UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,765	02/12/2002	Ashish Banerji	PD-201157	9961

7590 08/16/2004

Hughes Electronics Corporation
Patent Docket Administration
Bldg. 1, Mail Stop A109
P.O. Box 956
El Segundo, CA 90245-0956

EXAMINER	
VO, TUNG T	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 08/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/074,765	BANERJI ET AL.	
	Examiner	Art Unit	
	Tung T. Vo	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-18 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-18 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 12 February 2002 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2. Claims 1-2, 11-14, and 16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. (US 6,167,084).

Re claim 1, Wang discloses a method of compressing video, comprising:

grouping video frames (fig. 8) that are between consecutive I-frames into a video data set; splitting (600 of fig. 6, note the input uncompressed digital video) the video data

set into a plurality of homogeneous files (PROGRAM 1-PROGRAM L of fig. 8, note each PROGRAM contains GOP that has I, P, and B frames, see also col. 8, lines 25-36); and

individually compressing each of the homogeneous files (MPEG ENCCODER 620, MPEG ENCODER 630 of fig. 6).

Re claim 2, Wang further discloses wherein the video frames include P-frames and B- frames (col. 3, lines 40-61).

Re claim 11, Wang discloses wherein said compressing includes bit plane encoding quantized transform coefficients obtained from the video data set (222, 225 of fig. 2, note each MPEG-ENCODER includes DCT and Q).

Re claim 12, Wang further discloses wherein said compressing includes performing a run-length encoding of bit planed encoded coefficients (VLC, 230 of fig. 2).

Re claim 13, Wang further discloses wherein said homogeneous files have similar statistical properties (PROGRAM 1, PROGRAM2 ...PROGRAM L of fig. 6, note each program has GOP including I, P, and B frames).

Re claim 14, Wang further teaches the method further comprising multiplexing the separate files into a bit stream (MUX, 660 of fig. 6).

Re claim 16, Wang further discloses a computer-readable medium bearing instructions for compressing video, said instructions being arranged, upon execution by one or more processors, to perform the steps of the methods (608, 610 and 645 of fig. 6).

Re claim 17, Wang a video compression system (fig. 6), comprising:

means (600 of fig. 6) for grouping video frames that are between consecutive I-frames into a video data set;

means (600 of fig. 6) for splitting the video data set into a plurality of homogeneous files (PROGRAM 1-PROGRAM L of fig. 6); and

means (620-630 of fig. 6) for individually compressing each of the homogeneous files.

Re claim 18, Wang further discloses means (660 of fig. 6) for multiplexing the individually compressed files into a bit stream.

3. Claims 1-2, 5, and 13-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Gordon et al. (US 6,621,870 B1).

Re claim 1, Gordon discloses a method of compressing video, comprising:

grouping video frames that are between consecutive I-frames into a video data set (figs. 3 and 4) ; splitting (116 of fig. 2, note encoding and multiplexing unit splits the video data set into files, VIDEO 1, VIDEO 2 VIDEO 10 of fig. 2) the video data set into a plurality of homogeneous files; and

individually compressing each of the homogeneous files (220 of fig. 2, see also col. 6, lines 42-48).

Re claim 2, Gordon further discloses wherein the video frames include P-frames and B- frames (col. 6, lines 42-48).

Re claim 5, Gordon further discloses wherein said splitting includes storing B-frame components of the video data set and P-frame components of the video data set in separate files (114 of fig. 1 and fig. 4).

Re claim 13, Gordon further discloses wherein said homogeneous files (VIDEO 1-VIDEO 10 of fig. 1, note each video has GOP, I, B, P) have similar statistical properties.

Re claim 14, Gordon further teaches the method further comprising multiplexing the separate files into a bit stream (260 of fig. 2).

Re claim 15. Gordon farther comprising prefixing a corresponding header to each of the separate files, said header indicating a size of a corresponding separate file (230 of fig. 2, see also col. 7).

Re claim 16, Gordon further discloses a computer-readable medium bearing instructions for compressing video, said instructions being arranged, upon execution by one or more processors, to perform the steps of the methods (102 and 116 of fig. 1, note the encoding and multiplexing unit inherently has a readable medium for executing a stored instruction).

Re claim 17, Gordon further discloses a video compression system (fig. 2), comprising:

means (116 of fig. 2) for grouping video frames that are between consecutive I-frames into a video data set (figs. 3 and 4);

means (116 of fig. 2) for splitting the video data set into a plurality of homogeneous files (VIDEO 1, VIDEO 2, VIDEO 3, VIDEO 10 of fig. 2); and

means (220 of fig. 2) for individually compressing each of the homogeneous files.

Re claim 18, Gordon further discloses means (260 of fig. 2) for multiplexing the individually compressed files into a bit stream.

4. Claims 1-2, 11-14, and16-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Wu(6,731,684 B1).

Re claims 1, 14, 17 and 18, Wu discloses a video compression system (fig. 1 and 2), comprising:

means (205 of fig. 1) for grouping video frames that are between consecutive I-frames into a video data set;

means (116 of fig. 1; 215 and 220 of fig. 2) for splitting the video data set into a plurality of homogeneous files ; and

means (225 of fig. 2; 120-127 of fig. 1) for individually compressing each of the homogeneous files;

means (140, 150 of fig. 1) for multiplexing the individually compressed files into a bit stream.

Re claim 2, Wu further discloses wherein the video frames include P-frames and B- frames (col. 4).

Re claim 11, Wu further discloses wherein said compressing includes bit plane encoding quantized transform coefficients obtained from the video data set (note each MPEG-ENCODER includes DCT and Q, col. 1, lines 55-60).

Re claim 12, Wu further discloses wherein said compressing includes performing a run-length encoding of bit planed encoded coefficients (MPEG encoder inherently has VLC).

Re claim 13, Wu further discloses wherein said homogeneous files have similar statistical properties (Each Video 1 comprises GOP including I, P, B; which are similar statistical properties).

Re claim 16, Wu further discloses a computer-readable medium (160, 165 of fig. 1) bearing instructions for compressing video, said instructions being arranged, upon execution by one or more processors, to perform the steps of the methods.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 3, 11-12, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gordon et al. (US 6,621,870 B1) as applied to claim 1 and in view of Carnahan (US 5,414,780).

Re claims 3, 11-12, and 16, Gordon teaches splitting video signal into video 1-video 10 but not include storing mode information of the video data set and motion components that includes storing horizontal components of the video data set and vertical components of the video data set in separate files, bit plane encoding quantized transform coefficients obtained from the video data set, performing a run-length encoding of bit planed encoded coefficients as claimed.

However, Carnahan teaches storing mode information of the video data set (horizontal and vertical vectors) and motion components (NxM horizontal and vertical image data block include vectors) that include storing horizontal components of the video data set and vertical components of the video data set in separate files (col. 3, line 49-col. 4, line 3); and bit plane encoding quantized transform coefficients obtained from the

video data set, performing a run-length encoding of bit planed encoded coefficients (col. 11 and 12, note TRANSFORMER (52), QUANTIZER (54), and CODER (56) performs transforming, quantizing and run-length coding the video data set).

Therefore, taking the teachings of Gordon and Carnahan as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the step of storing the mode information and motion components into the separate files (memories) and the transformer, quatizer and coder of Carnahan into the encoder of Gordon for the same purpose of run-length coding the transformed, quantized video data set that retrieves from the separate files.

Doing so would provide the quantization process reduces the magnitude or number of bits of each quantized word and the coder circuit to implement coding in an efficient manner.

7. Claims 9-10 and 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Gordon et al. (US 6,621,870 B1) as applied to claim 1 and in view of Banerji (US 6,400,289 B1).

Re claims 9, 10, and 16, Gordon teaches the encoder for encoding the video but not applying a grammar-based code, and wherein said applying includes employing a YK algorithm as claimed.

However, Banerji teaches a grammar encoder (20 of fig. 1) for applying a grammar-based code (cols. 1 and 2), and wherein said applying includes employing a YK algorithm (col. 2). Therefore, taking the teachings of Gordon and Banerji as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the grammar

based code and the YK algorithm of Banerji into the encoder of Gordon for improving the encoded quality image so that the encoder can potentially increase the compression efficiency as suggested by Banerji (col. 6).

8. Claims 6, 7, and 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Gordon et al. (US 6,621,870 B1) as applied to claim 1 and in view of Kato et al. (US 5,719,986).

Re claims 6, 7, and 16, Gordon teaches the encoder for encoding the video sequence into the MPEG compliant transport stream using predicted frame information but not include storing mode 3 B- frame components of the video data set and mode 0, 1, and 2 B-frame components of the video data set in separate files and different color components of the video data set in different files as claimed.

However, Kato teaches storing mode 3 B- frame components of the video data set (61 of fig. 3, note intra prediction for B-frame) and mode 0, 1, and 2 B-frame components (14, 23 of fig. 3, note forward prediction, backward prediction, and bi-directional prediction) of the video data set in separate files and storing different color components of the video data set in different files (12 of fig. 3, see also fig. 5C, note Y, Cb and Cr are different color components) .

Taking the teachings of Gordon and Kato as a whole, it would have been obvious to one of ordinary skill in the art to incorporate the teachings intra-prediction mode for B-frame having forward, backward, and bi-directional prediction of Kato into the encoder of Gordon to improve efficiency of encoding. Doing so would provide to a decoder a higher quality image.

9. Claims 8 and 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gordon et al. (US 6,621,870 B1) as applied to claim 1 and in view of Weinberger et al. (US 5,680,129).

Re claims 8 and 16, Gordon fails particularly teach mapping negative values in one of the homogeneous files into positive values as claimed.

However, Weinberger teaches mapping negative values in one of the homogeneous files into positive values (col. 15, lines 59-64). Therefore, taking the teachings of Gordon and Weinberger as a whole, it would have been obvious to one of ordinary skill in the art to modify the technique of mapping negative values into one of homogeneous files into positive values into the encoder of Gordon to improve performance of encoding color image. Doing so would result in a more efficient compression of the image.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Lim et al. (US 6,333,952 B1) discloses decoder for digital TV receiver.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tung T. Vo whose telephone number is (703) 308-5874. The examiner can normally be reached on 6:30 AM - 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris. Kelley can be reached on (703) 305-4856. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TUNG T. VO
PATENT EXAMINER

T.Vo

Tung T. Vo
Primary Examiner
Art Unit 2613